

Flight Test *Safety* Fact



Published for the Flight Test Safety Committee

In This Issue

FTSW Videocasts Available – see the theme and watch the videos – hyperlink below.
Getting our Hands Dirty – Thoughts on Culture and petri dishes, gardening and such
Turbo Talk, in which the FTSC Chairman wonders aloud if “high vis” increases risk
Recommend our Podcast: listen to NASA’s Jim Wetherbee explain Controlling Risk

FTSW Videocasts Available

The Flight Test Safety Committee held its “virtual” Flight Test Safety Workshop (FTSW) on 27 May 2021. The videos are online: <http://www.flighttestsafety.org/ftsc-news/298-2021-virtual-flight-test-safety-workshop>.

Tutorial

SMS Fourth Pillar Safety Promotion | Tom Huff – Gulfstream; Rod Huete – Flight Test & Safety Consultants; Sonnie Bates – Wyvern

The tutorial took a close look at what comprises industry standards for SMS Safety Promotion and the recommended practices that would enable an effective program for flight test organizations. High-performing organizations recognize that a Safety Management System (SMS) can provide tremendous safety benefit, but only if all four components are present, operational and effective. None drive to *culture* more than Safety Promotion, an organization’s commitment to investing in its personnel and communicating safety information.

Presentations

- Simplifying Safety in a Complex Environment - Building Organizational Accountability Whilst Maintaining Standardization | Collin Drake - 412th Test Wing
- Flight Test CRM: A Dedicated Approach to Training | Eric Kinney – FAA
- Safety in Civilian Contract Flight Test Organizations | Scott T. Glaser, PhD - Flight Research, Inc.
- Zero Margin | William B. Scott - Aviation Week & Space Technology (Retired)

Getting our Hands Dirty – the Hard Work of Cultivating Safety Culture

Mark Jones Jr.

The word culture appears often in today’s vernacular, and this includes the aviation and flight test safety domain. Most often it appears as a noun, and it describes things like the way we talk, the clothes we wear, norms and behavioral commonalities, etc. For

example, I always thought that wearing a white, crew neck t-shirt underneath a dress-shirt was a faux pas but especially when the outfit included a blazer. (Only Turbo can get away with a sports coat and a t-shirt.) But such a statement becomes an even more egregious fashion crime where norms dictate the wear of the military uniform. In my opinion, military officers trying to fit in with silicon valley by making a fashion statement just isn't a good look. The point is, this expectation is part of "culture."

The word culture is also a verb. "To culture" suggests something growing in a petri dish, and it may not accurately convey the meaning we intend when applying it to safety. Cultivate is a word with a similar etymology, and this word conjures mental images of working the soil. It describes what I think is the hard work of actually creating and sustaining culture, and it suggests to us that the fertile fields of agriculture as analogy for growing organizational culture.

Some people see plants like green peas, known as annuals, and observe the complete life cycle occurring in a short period of time. In one season, it goes from seed to harvest, and after yielding its crop ceases to exist. We often think that life is linear like this, growing quickly and bringing forth "fruit," the hallmarks of achievement at various levels and stages of a career. We apply this same mental model to the development of safety culture, and it creates implicit expectations about the results we expect. Unfortunately, the real fruits of safety culture may not be annuals.

Others describe an organization more like the cycle of a tree, which grows during the spring and summer and during the autumn sheds its leaves and falls dormant for the cold winter months, only to begin its growth cycle again the following spring. This seems to me like a slightly more accurate picture.

If I could extend the metaphor even more, I would add several steps. We prepare the soil, getting our hands dirty and working up a sweat. One might even grunt aloud or skin one's knuckles during the exertion required to remove rocks and brush from the soil. Once we prepare the ground, we plant the seed and begin to nurture it. Although we cannot observe it, a transformation takes place beneath the soil. We continue to water, weed, and feed the young plant.

Finally, as the sapling shoots upward, we continue to labor but only within a small sphere of influence, for we cannot control the wind, rain, sun or shade. Each growing season brings new challenges. Though the process remains unchanged and relatively simple, it does require hard work, and it's important to emphasize that the level of exertion ebbs and flows. Ultimately though, we don't control the growth of the plant or its fruit. We are utterly dependent on the sun and shade, wind and rain.

There is also a symbiosis that takes place between the tree and other members of the ecosystem—so too in life and in our profession. This is perhaps the most valuable aspect of our Flight Test Safety Committee and Workshops.

In recent scientific news articles, a Northwestern neuroscientist explained the impact social settings have on thought patterns and behaviors of individuals in these groups. His most important piece of advice was to control your environment by “choosing your friends wisely.” Since decision-making is both faulty and exhausting, he argues that picking your social circle maximizes your chance of reaching happy, fulfilling outcomes.¹ In other words, the culture of an organization can influence safety thought patterns and behaviors.

There are other lessons we can learn from this metaphor that apply to flight test safety and safety culture, but to do so would require each of us to make the time and take the energy to think about it, to make cognitive space for rumination. It requires margin. Safety is not something you schedule, but margin is. Having margin applies to other areas too, like fuel planning. Using margin correctly enhances safety, but having time and cognitive margin may be the most important and most difficult margin of all to create.

The next such principle I would offer is this: Consider what you are doing differently during this season. Deciduous trees bear fruit in the spring and summer, but in the fall they do not. Is our behavior different during the seasons of life? Is there something I should stop doing? Is rest the need of this season? In all of this I urge the reader to see from a different perspective. Sometimes it's the beauty right before us in a landscape that we miss. At other times, there is something magnificent off in the distance that we fail to notice because we've focused on the foreground. Perhaps it's merely a shadow, but it tells us something about the path of light. In its absence, it gives an indication of what we're really searching for. Seeing all of these things requires extra time, benefits from lingering, an option that is only available when we have margin.

Words are also part of our culture, and the analogies we use to describe things are different in the various organizations and nations around the world. We've been talking about agriculture, but it is a mental model for thinking about culture, and it gives us a common language. That brings us to the phrase “risk management.” It's becoming more popular to refer to ourselves as risk managers. I'm not sure that's right. Farmers don't call themselves “climate managers” or “pest managers.” Personally, I don't consider myself a risk manager. Call me a leader or a pilot in command or an officer, depending on what context we are in. Those words mean something richer and deeper than risk manager. I'd ask you to use a term that reminds us of the gravity of the decisions we are making: Lives are at stake.

In closing, I would summarize this way: It takes work to cultivate something meaningful, and some of the factors are out of our control. Additionally, it's not about the fruit, but about the men and women that the fruit will sustain. Finally, if you find the crop of fruit this season is not what you expected, it pays to have enough margin to allow you to absorb the deficit. Anyway, let those ideas germinate, and when you bump into a colleague next week, I hope you have the margin in your schedule to catch up and talk through the importance of culture and the hard work of making it take root. And if you find something fruitful that would help others, send me an email with your thoughts: mark@flighttestfact.com.

Turbo Talk

Art "Turbo" Tomassetti

I want to start off by saying thank you to everyone who was a part of our 2021 virtual Flight Test Safety Workshop: Our team that put it together, our speakers, and to all of you who were able to participate. This was our second year having to move to an online option due to current restrictions related to COVID-19. Of course, we would all prefer to meet in person, not just for the social aspects, but for that intangible gain that comes from sidebar discussions, chance encounters, and networking opportunities—exactly what Mark mentioned above. While cancelling the event would have been the easy option, we felt that we needed to offer something in order to further our mission: ***To promote flight test safety and continually improve the profession's communication and coordination.*** So, we continue to adapt and innovate, and I feel that we accomplished our goal with this workshop. If you were unable to attend you can find selected videocasts from the workshop on our webpage.

The other item I wanted to talk about this month is an event that happened 20 years ago, in July of 2001. It was called "Mission X". I know you can almost hear the epic music playing and feel like you should be sitting in a movie theater watching (in 3d or IMAX of course). Feel free to grab your popcorn as you read. While the title makes it a natural for a blockbuster movie, it was actually a flight test event for the Lockheed Martin X-35B. I was fortunate to play the role of test pilot that day along with a cast of engineers, maintainers, chase pilots, airfield and ATC personnel, and many more. The Mission X flight profile was pretty straightforward. Short Takeoff - Climb to 25,000 ft - level accel to 1.05 Mach - descend to 15,000 ft for some handling qualities test points and finally return to base for a vertical landing. None of the maneuvers were particularly hard, and individually each had been performed in the aircraft on prior flights. But the significant point was that all those maneuvers had not been done in a single flight before, ever, in any aircraft, as far as our research had found.

There are a lot of aspects of this mission I like to talk about. There is the team work, overcoming challenges, historic, technical challenges, and a few more. But the one I want to talk about today is the risk. Sure, it was an experimental aircraft that had only been flying for about a month. Sure Short Takeoff and Vertical Landing (STOVL) flight test events historically have had some challenges. Yes, we had defined the entire

flight test program for X-35 as high risk so of course there was that. But, as I mentioned, we had done each element of the flight successfully before. The difference for Mission X was getting everything done on a single tank of gas. Of course, even for that we could have cut the flight short at any point if we got too far off the planned fuel profile.

I know all the risks we identified and all the mitigations we had in place that day. But here is something I have wondered about for this event and a few others in my career. Is High Visibility or “High Vis” a risk in and of itself? There is no doubt this was a High Vis event, beyond just the camera crews and VIPs, we were in the middle of an old-fashioned fly off between the X-35 and the X-32. There was a tremendous amount riding on each flight, especially the ones where a potential complete advantage could be gained.

As we ponder this let’s ask a few questions:

Does High Vis change/impact the performance of the aircraft? No.

Does High Vis limit options or risk mitigations? No.

Does High Vis change the performance/behavior of the test team? Umm... Maybe.



Figure 1 – Photo Credit:
<https://www.lockheedmartin.com/en-us/news/features/2019-features/the-hat-trick-history--mission-x.html>

If I am being totally honest, I can point to events in my career where I think it was a yes not a maybe. Interestingly enough the Mission X event was not one of those for me. In fact, it turned out to be one of my most memorable and significant (for me) uses of the “no vote” in my career. But that is a story for another time.

But circling back to the question, “Is High Visibility a risk in and of itself?” If your answer is no, that’s fine, thanks for reading and please move along to the next article. If your answer is yes, what would you propose as ways to mitigate the risk? If your answer is maybe then I encourage you to grab a few coworkers, teammates, other flight testers, friends, or even fellow commuters on the subway or family (if you are struggling for dinner conversation topics) and talk about it. Ask yourselves if being in the spotlight, having a crowd watching, maybe like at an airshow or any other event where the “World is watching” makes you do things, take risks, push harder than you would if no one was watching. Let me know your thoughts...I think this topic may be a future podcast. That’s all for now, until next time Be Safe, Be Smart, and Be Ready!

Turbo
Chairman Flight Test Safety Committee

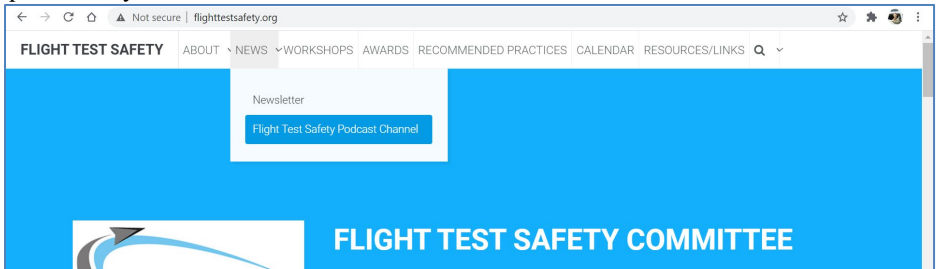
Art Tomassetti

Recommend our Podcast

Retired NASA astronaut **Jim Wetherbee** joined Turbo to discuss Controlling Risk in the latest podcast. Part of our culture is how we talk about things. Jim cites three distinct differences between “managing risk” and “controlling risk.”

- 1) How the organizations assesses or calculate risk compared to risk realization at the individual level
- 2) Managers can change the mission or the systems, if they deem the risk is assessed as too high, but the operators don’t have that luxury.
- 3) Managers publish and promote rules-based procedures, but Jim recommends principle-based techniques that are more adaptive to the reality operators encounter on the front line of complex operations.

It’s a great conversation, and he was quick to respond to my own personal follow up questions by email.



This podcast is a way to stay connected to the people who can cut through the noise and point you to the right literature, paper, or presentation. Wisdom takes work, and podcasts are a way to work smarter. Any one of us can listen to this podcast on our commute or during a workout. It doesn’t take long to subscribe, and it takes even less time to recommend it to a colleague. If you have suggestions, please email them to chairman@flighttestsafety.org. Please subscribe to the Flight Test Safety Podcast on the [Apple](#) or [Google podcast app](#). You can also navigate directly to the recording in [a browser](#) and leave comments on these platforms.



Contact Flight Test Safety Committee

Art “Turbo” Tomassetti, Chairman
 Susan Bennett, FTSC Administrator
 Society of Flight Test Engineers
 Society of Experimental Test Pilots
 AIAA Flight Test Group

chairman@flighttestsafety.org
susan@setp.org
edir@sfte.org
setp@setp.org
derek.spear@gmail.com

Contact *Flight Test Safety Fact*

Mark Jones Jr, Editor

Website: flighttestsafety.org

mark@flighttestfact.com
 Podcast: ftscchannel.podbean.com/

Connect with us by joining the LinkedIn Group: “Flight Test Safety Committee”